

ABSTRACT

A ceramic thermal barrier coating (46) having a plurality of segmentation gaps (44) formed in its top surface (56) to provide thermal strain relief. The surface width of the gaps may be limited to minimize the aerodynamic impact of the gaps. The gaps may be formed as continuous grooves (68) extending along a flow path of a fluid stream traveling over the thermal barrier coating. Such grooves may be used in the fluid stream without removing the ridge (60) created by splashing of molten material onto the surface of the coating during a laser engraving process used to form the grooves, since the fluid stream is flowing parallel to the ridge. Preferred failure planes (A1, A2, A3) may be formed through the thickness of the coating in order to stimulate the generation of a fresh surface when a portion of the coating fails by spalling. The bottom geometry of the gaps may be formed to have a generally U-shape in order to minimize stress concentration. The gaps serve to reduce the crack driving force along the interface between the thermal barrier coating and an underlying bond coating.